

Backflow Prevention

In 1997, The Department of Natural Resources revised a drinking water regulation entitled “Backflow Prevention.” This revised regulation places certain responsibilities on water suppliers to ensure that customer facilities identified as actual or potential backflow hazards provided the necessary protection to prevent the introduction of contaminants into the public water system.

What Exactly is Backflow?

Backflow is defined as the unwanted reversal of flow in a water distribution system. Due to changes in the hydraulic pressure in a water distribution system or a piping system inside a customer’s premises, backflow occurs on a regular basis.

The polluting substance, usually a liquid, tends to enter the potable water supply if the net force acting upon the liquid acts in the direction of the water supply. Therefore, two factors are essential for backflow to occur. First the normal direction of flow in the distribution system must be interrupted. Second, there must be a link or connection, between the potable system and the source of contamination.

Backflow only becomes a serious problem when there are cross connections within the water distributions system.

Public Health Significance of Cross Connections

A cross connection is a physical link between a source of pollution or contamination with a potable water supply.

Public health specialists have long been aware of the threat to public health posed by cross connections. Education is the most important factor in cross connection control. No one would intentionally connect plumbing fixtures, equipment, etc. to their water supply if they knew it would contaminate their drinking water. But it happens thousands of times a day.

Various court decisions have held water purveyors responsible for the delivery of safe water to consumers. But the safety of our drinking water supply can be jeopardized at any location, at any time because of the frequency of plumbing defects and cross connections. Due to frequent changes in piping systems, an effective cross connection control program, including continued surveillance of the public water system, is necessary to prevent backflow incidents.

Education is the most important factor in cross connection control.

Components of an Effective Cross Connection Control Program

The first step in preventing backflow incidents is enacting local rules that grant the water supplier the authority to enforce the cross connection control program. For the water supplier to comply with the State Backflow Prevention Regulation, the local rules should include the following provisions:

- a requirement for annual testing of assemblies and inspection of air-gaps;
- authority to enter customer premises for purposes of inspection; and
- authority to terminate water service for failure to comply.

Another responsibility of the water purveyor is to notify customers where backflow hazards exist that they must comply with the local rule. Once these customers have been notified, the purveyor must maintain records of inspections, exemptions, or installation of assemblies.

A local program may not be less stringent than state regulations.

Local plumbing codes may require additional backflow prevention devices.

Methods of Backflow Prevention

The Public Drinking Water Program maintains an up to date list of backflow prevention assemblies that have been approved by the Foundation for Cross Connection Control and Hydraulic Research at the University of Southern California (www.usc.edu/dept/fccchr/) The following methods of backflow prevention meet the requirements of the State Backflow Prevention rule.

Air-gap: An air-gap is the most positive method of backflow protection. It is a physical separation between the water supply and the customer's internal piping system. The distance for an air-gap must be at least two times the diameter of the pipe. For example, a two-inch separation is required for a one-inch water supply pipe.

Reduced Pressure Principle Assembly:

A reduced pressure principle assembly, often referred to as an RPPA, is the highest level of mechanical backflow protection. The RPPA has a hydraulically operated relief port located between two spring loaded check valves. A drop in pressure from the supply or an increase in back pressure from the customer's facility will cause the check valves to close and the relief port to open, thus creating an air-gap within the assembly. If either check valve becomes fouled by debris, the relief port will also open. The drawback to using an RPPA is that it will lower the pressure available to the customer's premises.

Double Check Valve Assembly:

The double check valve assembly or DCVA, is designed for low hazard protection only. The DCVA has two spring valves that act independently to provide protection from back pressure and back siphonage. The drawback to DCVA's is that both check valves are susceptible to fouling by debris in the water system, thus hindering their function and allowing backflow to occur.

Testing/Inspection Requirements

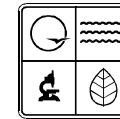
The function of all backflow prevention devices must be reviewed annually. Air-gaps may be inspected by the water purveyor. A State certified backflow prevention assembly tester must perform the specific testing procedures required to verify the proper function of reduced pressure principle assemblies and double check valve assemblies.

The Public Drinking Water Program maintains an up to date list of certified backflow prevention assembly testers.

For More Information

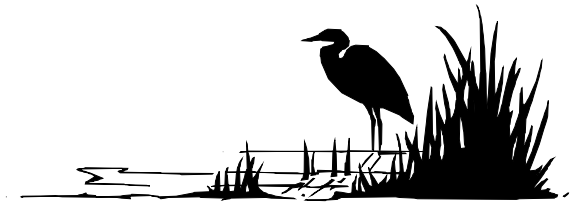
Please contact you local Regional Office or the Public Drinking Water Program of the Missouri Department of Natural Resources.

Public Drinking Water	573-751-5331
Northeast Region Office	660-385-2129
Southwest Region Office	417-891-4300
Southeast Region Office	573-840-9750
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**Missouri Department
of Natural Resources**

Basics of Backflow Prevention



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